

**STRATEGY  
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**WILL THE FORCE XXI REVOLUTION IN MILITARY LOGISTICS  
SUPPORT COALITION OPERATIONS IN 2010?**

**BY**

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USAWC STRATEGY RESEARCH PROJECT

**Will the Force XXI Revolution in Military Logistics Support Coalition Operations in  
2010?**

by

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## ABSTRACT

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The President's National Security Strategy emphasizes coalition operations to secure basic U.S. national goals, protect and promote U.S. interests, and create preferred international conditions. The U.S. Army is currently undergoing a revolution in military logistics (RML) that is leveraging technology to fuse new concepts, information, and logistics systems, reshaping the way we project and sustain America's Army in the 21<sup>st</sup> Century. The key element of the RML is focused logistics, which integrates information superiority and technological innovations to develop state-of-the-art logistics practices and doctrine. Force XXI logistics doctrine emphasizes the combat service support (CSS) tenants of unity of command, increased velocity, agile logistics force structure, and situational awareness. The Force XXI tenant of increased velocity directly supports focused logistics. This paper discusses the use of the Force XXI tenant of increased velocity and its impact on Coalition Operations during military operations other than war (MOOTW) or now commonly called small-scale contingency (SSC) operations. Specifically, the four concepts that embody focused logistics along with the associated technology enablers are addressed. Alternatives to providing support during SSC operations are proposed and recommendations are made to improve support to coalition operations during SSC to assist the U.S. Military in conducting these operations.



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## WILL THE FORCE XXI REVOLUTION IN MILITARY LOGISTICS SUPPORT COALITION OPERATIONS IN 2010?

The President has developed a National Security Strategy which emphasizes that the U.S. will remain engaged abroad while supporting efforts to enlarge the community of secure, free-market, and democratic nations and to create new partners in peace and prosperity. While the United States will retain the capability to act unilaterally when necessary, this strategy emphasizes coalition operations to secure basic U.S. national goals, protect and promote U.S. interests, and create preferred international conditions. The nature of the challenges the nation faces demands cooperation, multinational approaches that distribute the burden of responsibility among like-minded states.<sup>1</sup>

Based on recent experience and intelligence projections, the demand for small-scale contingency (SSC) operations is expected to remain high over the next 15-20 years.<sup>2</sup> SSCs vary in size and duration from as few as 100 to as many as 30,000 personnel, and from a few weeks to several years.<sup>3</sup> These contingencies are often coalition operations that involve core states, other foreign forces, non-governmental organizations (NGOs), as well as U.S. forces. It is imperative that U.S. forces be prepared to interface with these other organizations and states.

The Quadrennial Defense Review (QDR) in 1997 established SSCs as a new mission for military operational requirements and a major consideration in deciding on force structure:

In general, the United States, along with others in the international community, will seek to prevent and contain localized conflicts and crises before they require a military response. . . . Therefore, the U.S. military must be prepared to conduct successfully multiple concurrent smaller-scale contingency operations worldwide, and it must be able to do so in any environment . . .<sup>4</sup>

Several studies showed that deployment of U.S. forces for participation in SSC operations put heavier demand than anticipated on selected combat, combat support, and combat service support forces.<sup>5</sup> Operations that involve civilian organizations or coalitions make extra demands on both the amount and nature of materiel required.<sup>6</sup> U.S. forces must be interoperable with other participants so that they can supplement their capabilities to meet these extra needs. As the U.S. military incorporates new technologies and operational concepts under the Revolution in Military Affairs, careful design and collaboration will be needed to ensure that the United States and its allies and partners are able to meet interoperability challenges.<sup>7</sup> The Army's roles and missions in 2010 will be planned and executed as part of a joint force in concert with other Services and other government agencies — even non-governmental organizations, and most probably with allies. The Army will engage in a wide range of missions, including humanitarian, drug interdiction, and immigration control operations.

While the operational force will engage in dominant maneuver and precision strike at the high end of the threat spectrum, focused logistics will span every operation across the entire mission spectrum — from humanitarian operations through war.<sup>8</sup> The revolution in military affairs will not succeed without a revolution in military logistics (RML). The RML is leveraging technology to fuse new concepts,

information, and logistics systems, reshaping the way we project and sustain America's Army in the 21st Century.<sup>9</sup> The key element of the RML is focused logistics. Focused logistics integrates information superiority and technological innovations to develop state-of-the-art logistics practices and doctrine. By utilizing focused logistics, U.S. forces will be able to accurately track and shift assets, even while en route, thus facilitating the delivery of tailored logistics packages and more timely force sustainment.<sup>10</sup> Focused Logistics and its Army logistics corollary distribution based logistics supported by a single logistics system are the enablers.<sup>11</sup> Distribution based logistics is one of four related Force XXI Combat Service Support (CSS) concepts which make up the core of the Force XXI tenant, increased velocity. This is essential for support to SSCs as the logistics component is much more complex and demanding.

To support focused logistics, Force XXI tenants and Concepts were developed. However, they were primarily designed for use by the U.S. Army alone to support major theater warfare (MTW). As a result, very little attention has been given to the design of these concepts when used in joint operations, and none for coalition operations.<sup>12</sup> Small-scale contingencies involving coalition operations have been the norm for the last ten years, and will likely pose the most frequent challenge for U.S. forces and cumulatively require significant commitments over time.<sup>13</sup> Based on this, it is important that the U.S. Army be prepared to operate with coalition forces, and specifically, the logistic system must be able to interface efficiently and effectively with coalition partners.

The thesis of this paper is that the use of focused logistics, and specifically the Force XXI CSS tenant of increased velocity, using a single coalition country to provide distribution to all coalition units within the sector, will support coalition forces involved in SSC operations more effectively and efficiently than the methods of support current being utilized.

To prove the thesis this paper describes the requirements of SSC operations and how focused logistics and Force XXI tenant of increased velocity and the associated concepts supporting this tenant can improve support to the coalition forces. The paper then describes the concepts and the necessary enablers to the concepts as well as specific requirements of coalition operations. Finally the paper describes three alternatives that can be used to provide support in SSC operations, discusses the pros and cons of these alternatives and follows with conclusions and recommendations.

## **FORCE XXI CSS CONCEPTS AND COALITION SMALL-SCALE CONTINGENCIES**

Small-scale contingencies, or operations other than war as they were formally called, are operations of a lesser military requirement than MTWs.

Operations other than war (OOTW) can involve combat missions ranging from strikes and raids to peace enforcement as well as noncombat missions that could include disaster relief and civil support both at home and abroad. Force projections in such an environment might include entirely different successive missions for a unit, involving noncombat operations in wartime or actual combat in OOTW. The flexibility involved goes far beyond agility, which emphasizes faster physical and mental reaction than the enemy.<sup>14</sup>

Coalitions partners participating in small-scale contingencies run the gambit from NATO countries with a high level of standardization and sophistication to third world countries with limited support capabilities. In order to be able to work effectively with the diverse capabilities of these varied countries, the U.S. must insure that logistics support practices remove barriers that prevent the maximum benefits from being gained during cooperative actions with other nations. To remove these barriers, the U.S. must concentrate on four areas: Establishing a framework for U.S. involvement in multinational operations; expand bilateral agreements; leverage multinational capabilities; and share technology to promote interoperability.<sup>15</sup> LTG Solomon, Commanding General of the Combined Arms Support Command (CASCOM) reinforced the requirement for establishing agreements before participating in a coalition operation.<sup>16</sup> He stated that there was a need for prepackaged agreements with coalition partners before the formation of the coalition and that legal issues need to be resolved first as some support relationships can be limited by law. In these cases, Congress needs to be informed and suggestions as to changes made to reduce the restrictions. Actions taken with coalition partners before operations are necessary can set the stage for successful logistics coalition operations. "The key to succeeding in a coalition crisis environment in interoperability. . . . We either promote U.S. systems internationally, or adapt to our allies' systems on a case-by-case basis."<sup>17</sup> Obtaining this goal, as well as the other three listed above, will require that the U.S. continue with the RML and adopt the relevant Force XXI concepts that support focused logistics. The desired end state of focused logistics in coalition operations includes equitable burden sharing among nations, operational efficiency, a reduced multinational footprint, stronger regional contact, and reduction in the costs of international peace operations.<sup>18</sup>

The Force XXI CSS tenants of unity of command, increased velocity, agile logistics force structure, and situational awareness support the RML. Table 1 lists all of the concepts and the tenants they support.<sup>19</sup> Twenty-two Force XXI CSS concepts were developed that embody the Force XXI principles. Each of the 22 concepts supports one of the four tenants. The Force XXI CSS tenant that embodies the basic ideas of focused logistics is increased velocity. Increased velocity consists of six concepts; four of which directly address the ideas of focused logistics. These four concepts are: distribution versus supply based logistics; configured loads; throughput to forward areas; and minimize load handling and materiel handling equipment.

## **INCREASED VELOCITY**

Of the six increased velocity concepts listed in Table 1, the highlighted four concepts directly address focused logistics. They are defined below.

TABLE 1 - CSS FORCE XXI TENANTS AND CONCEPTS

Unity of Command	Increased Velocity	Agile Logistics Force Structure	Situational Awareness
Single Logistics Operator	<b>Distribution versus Supply Based Logistics</b>	Modular Design	Common Operating Picture
Centralized Distribution Management	<b>Configured Loads</b>	Split Based Operations	Intransit Visibility
Surge Capability	Scheduled Delivery	Multi-Capable Mechanic	Security of CSS
Tailorable Force Packages	<b>Throughput to Forward Areas</b>	Contractors on the Battlefield	Seamless Information Network
	Time Definite Delivery	Replace Forward/Repair Rear	Near Real Time Information
	<b>Minimize Load Handling and Materiel Handling Equipment</b>	Combination Direct Support and Organizational Maintenance	Integrated STAMIS

#### DISTRIBUTION VERSUS SUPPLY BASED LOGISTICS

Leveraging information, force structure, technological enablers, and command and control relationships to move the Army's logistical system away from its traditional dependence upon echeloned stockpiles to a system that utilizes anticipation, visibility, and velocity to make the distribution pipeline the Army XXI warehouse.

#### CONFIGURED LOADS

Leveraging information and technological enablers to build pre-configured loads (Strategic, Mission & Unit) at the Strategic and Operational (Theater & Corps) levels to facilitate throughput to forward areas, minimize handling, and reduce the reliance upon forward stockpiles.

#### THROUGHPUT TO FORWARD AREAS

Leveraging configured loads, containerization, information, force structure, technological enablers, and command and control relationships to deliver sustainment from the operational level directly to the supported unit or its direct support unit bypassing intermediate general or direct support units.

## **MINIMIZE LOAD HANDLING AND MATERIEL HANDLING EQUIPMENT**

Leveraging configured loads, containerization, information, force structure, technological enablers, and command and control relationships reduces the number of times sustainment is handled by multiple echelons and support units between the Strategic provider and the ultimate customer and reduces the dependence upon MHE for intermodal transfers and delivery.

## **VELOCITY ENABLERS**

The basic development model calls for the development of new doctrine first, then the development of the necessary training, leader development, organizations, and then materiel.

This order runs the risk of distorting the result of technological breakthroughs. If doctrine dominates technology, the technological advantages may be overlooked, causing a quiet evolution rather than the much greater change that may be possible or necessary.<sup>20</sup>

The use of the load handling system (LHS) technology is one that has the potential to generate a revolution in sustainment operations that drives doctrine rather than the other way around. In an SSC, flexibility is critical and the LHS provides that ability to quickly provide sustainment in an ever-changing environment.

The primary means of movement of supplies in the U.S. corps rear and division areas will be LHS-equipped vehicles. There will be a family of vehicles with the LHS: PLS at 16.5-tons cargo capacity; HEMTT-LHS at 11-tons cargo capacity; and Family of Medium Tactical Vehicles with Load Handling System (FMTV-LHS) at 6.5-tons cargo capacity. It is expected that each will be used for the movement of flatracks to the user based on the operational situation, weight of the cargo, and availability of LHS vehicles.

The LHS technology has the ability to provide the necessary flexibility required by SSCs to provide the faster reactions required to stay ahead of the situation. When used in conjunction with other distribution enablers, the LHS has the potential to greatly improve the efficiency and effectiveness of the distribution system, from depot to using unit. These other enablers include enhancements to the PLS: Movement tracking system, global positioning system, and driver vision enhanced.

## **PALLETIZED LOAD SYSTEM -- ENHANCED**

The primary method of movement of supplies using Force XXI concepts will be Strategic Configured Loads (SCLs) destined for a unit as far forward on the battlefield as possible.

The primary vehicle for delivery of supplies in the corps rear area is the PLS. It is expected that this vehicle will deliver most supplies from the corps to the division. The PLS has the advantage of being able to lift any flatrack load configured in the corps for movement forward. PLS were originally purchased for the delivery of ammunition using the Maneuver Oriented Ammunition Distribution System (MOADS). As such, the primary mission for the PLS is the delivery of ammunition. If HEMTT-LHS is used to move some of the lighter ammunition forward or there is a smaller requirement for ammunition delivery, PLS can be used to deliver other supplies based on its availability. The PLS has been enhanced by the addition of the movement tracking system, global positioning system, and driver vision enhancer. The movement tracking system, in conjunction with the global positioning system, allows for the precise tracking of the vehicle and its cargo to insure total asset visibility. A dispatcher can send messages to the driver and the driver can send messages back to the dispatcher. This is necessary to change the delivery location while the driver is en route or for the driver to report problems. The global positioning system also allows the driver to determine his precise position to assist in getting to his destination without being lost. The driver vision enhancer provides an infrared display screen that allows all-weather day or night movement of supplies.



FIGURE 1 - PLS WITH FUEL RACK

## OTHER LOAD HANDLING SYSTEM (LHS) VEHICLES

The PLS is a heavy version of an LHS vehicle with a load capacity of 16.5-tons. Lighter versions uses load handling hydraulics similar to are identical to the hydraulics on the PLS to provide smaller, lighter vehicles with lower cargo capacity. These lighter vehicles include the Heavy Expanded Mobility Tactical Truck (HEMTT) and Family of Medium Tactical Vehicles (FMTV) with an expanded chassis. The first of these new systems, called the HEMTT-LHS, is capable of hauling 11 tons on a NATO standard flatrack, a PLS module, or an ISO container weighing less than 12.5 tons. It was shown in a 1993 PLS Distribution Analysis that more than 90 percent of all non-ammunition loads (and over 50 percent of ammunition loads) were less than 11 tons.<sup>21</sup> This implies that the lighter and cheaper HEMTT-LHS is capable of performing most of the standard transportation missions in an SSC and can use the standard NATO flatrack. The other of these new systems is called the FMTV-LHS, which can haul an LHS module weighing 8-tons or a standard flatrack with 6.5-tons of supplies. This is the alternative of choice due to the reduced cost and weight of these systems as well as their improved transportability. The heavy expanded mobility tactical truck with load handling system (HEMTT-LHS) and family of medium tactical vehicles with load handling system (FMTV-LHS) each will pick-up and deliver a standard flatrack or container roll-in/out platform (CROP). The CROP is a flatrack that is slightly smaller so it can fit inside a standard 20-foot container. This allows supplies to be loaded on a CROP at the depot and moved intermodally to the theater where the CROP can be removed from the container and delivered to the using unit by an LHS-equipped vehicle. The only difference from the PLS is the weight of the cargo which can be carried on the rack. The HEMTT-LHS can carry an 11-ton load on a flatrack or a 13-ton LHS module. The FMTV-LHS can carry an 8-ton module or 6-tons on a flatrack. Work done by CASCOM for the LHS concept evaluation program (CEP)<sup>22</sup> showed that over 70 percent of loads were under the capacity of the HEMTT-LHS and some common unit equipment (e.g., medical shelters) are under 8-tons. The largest single quantity of these loads was MLRS pods on a CROP as shipped from the depot (at 10.3-tons).

Photograph provided by the Author

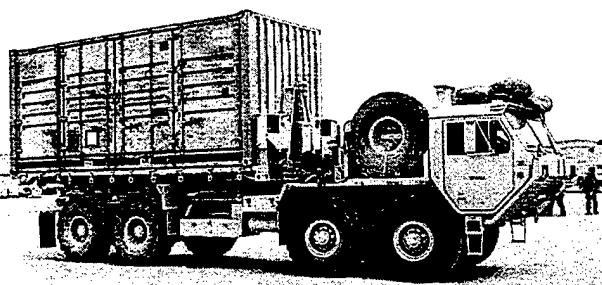


FIGURE 2 - HEMTT-LHS

Stewart and Stevenson



FIGURE 3 - FMTV-LHS

## **COALITION OPERATIONS – FOCUSED LOGISTICS REQUIREMENTS**

Because of the way past SSC operations have been designed, most sustainment is stove-piped by each coalition partner.<sup>23</sup> In some cases, common items are delivered by the country in charge of the sector, but assets provided by each coalition partner deliver most of their requirements from outside the sector to their unit location.

SSC operations are generally in areas that are difficult for commercial vehicles to operate. As a result, the PLS has been the vehicle of choice for U.S. forces for the movement of all classes of supply in these areas.

The use of the PLS in Operation Joint Endeavor is a key indicator of its worth. The PLS' ability to move all classes of supply and containers, while demonstrating unprecedented mobility and agility, have made it the vehicle of choice for sustainment operations. In-theater commanders have been so impressed with the PLS capability that they have persuaded Department of Army to provide an additional 37 PLS trucks, trailers and accompanying flatracks to support continued operations. These 37 vehicles will have enhanced capability through the use of extended range fuel tanks and a sealed lubrication system. These enhancements will allow the PLS to operate in the extended operational space of the Bosnian theater and reduce maintenance time.<sup>24</sup>

Based on history, these operations will also put a premium on the ability of the U.S. military to work closely and effectively with other U.S. Government agencies, non-governmental organizations, regional and international security organizations and coalition partners.<sup>25</sup> To assist in providing the U.S. military the capability to work with coalition partners, exploiting of the technology provided by LHS-type vehicles to its fullest will provide the necessary support to sustainment operations.

## **ALTERNATIVES**

There are several methods of providing the necessary logistics support to SSC operations. Each has its advantages and disadvantages from an operational requirement perspective as well as from the level of interoperability. Based on the location of the SSC, some alternatives may not be able to perform the mission, as the roads may not support commercial types of vehicles.

The first alternative is to have each of the coalition partners responsible for providing logistics support to their own forces, to include the delivery of supplies from within the theater. This can be done with their own vehicles or by a contractor providing this service to the coalition partner under a contract negotiated by each country for their own forces. This is the primary method used today, especially by U.S. forces.

The second alternative is to have the coalition partner responsible for the sector provide distribution of common use items used by all coalition partners within the sector to a common distribution point. Each of the other partners would then pick up these items from this common point and also provide the

distribution and transportation for any supplies that are unique to that coalition force from outside the sector. This method is used in some sectors today, primarily by the British.

The third and last alternative has the coalition partner responsible for the sector provide the distribution of supplies to each partner in the sector using the modern Force XXI focused logistics distribution concepts and enablers. Supplies would be delivered on flatracks or in containers to each coalition force within the sector by the sector lead. The coalition partners would then unload and make distribution to their forces. This would be done using the new PLS-E as well as a new lighter versions of the PLS for U.S. Forces or by NATO standard PLS compatible vehicles used by our NATO allies. Countries that are leading a sector and do not comply with the NATO standard for use of a PLS flatrack would have to be equipped and trained on the use of this equipment, either loaning the equipment to them or selling it using Foreign Military Sales.

The following section will look at each of these alternatives in detail and discuss the advantages and disadvantages of each. The uses of LHS-equipped vehicles in the theater of operations will be highlighted, as this is the main enabler for focused logistics. Although LHS-equipped vehicles were originally designed for use in MTWs, their use in SSC operations is especially pertinent due to extra requirements for flexibility, the general fixed location of the forces, and the need to interface with coalition partners.

## **ANALYSIS OF ALTERNATIVES**

Alternative one includes the concept of having each of the coalition partners responsible for providing logistics support to their own forces, to include the delivery of supplies from within the theater. This concept has the advantage of not requiring any coordination among the coalition partners for their supply requirements. The only coordination required is for movement control over the main supply routes (MSRs). The disadvantages include: increased traffic on the MSRs; a lack of understanding of the requirements of each of the coalition partners in the sector; the possible inability of some of the coalition partners to get their supplies regularly due to road conditions and not having vehicles with a high enough mobility to traverse safely; an increased requirement for supplies on the ground within the sector to accommodate disruptions in the supply flow due to congestion and road conditions; and increased requirements for MHE by each coalition partner to unload their supplies.

Alternative two requires that the coalition partner responsible for the sector will provide distribution of common use items used by all coalition partners within the sector. This alternative has the advantage of decreasing traffic on the MSRs slightly due to the consolidation of common use items by all coalition partners. This requires additional coordination with all of the coalition partners in the sector to determine the requirements of these items and to provide notification when the common items are available for pick up at the distribution point. Coordination of the coalitions will still be required on the MSRs for the

delivery of all other items. Although traffic on the MSRs is reduced, it is still significant. Additionally, there is still an increased requirement for supplies on the ground within the sector to accommodate disruptions in the supply flow due to congestion and road conditions and an increased requirement for MHE by each coalition partner to unload their supplies. Some smaller coalition partners may also still encounter difficulty getting their supplies due to a lack of vehicles with a high enough mobility to traverse difficult terrain.

Alternative three includes having the coalition partner responsible for the sector provide the distribution of supplies to each partner in the sector using the modern Force XXI focused logistics distribution concepts and enablers. This concept has many advantages, as well as several disadvantages, which are discussed in more detail below.

In 1993, it was shown that conversion of the distribution function to LHS increases the efficiency of the distribution system by 33 to 47 percent.<sup>26</sup> When the on-board hydraulic system of the LHS is used extensively, the need for MHE is reduced. This results from a combination of the LHS itself, and the full use of its capabilities. When the LHS is used correctly, strategic configured loads (SCLs) and combat configured loads (CCLs) are delivered directly to the appropriate user. This reduces or eliminates the need for MHE for the trans-loading. When there is no need for reconfiguration, there is no need for MHE. This reduces the need for MHE to handle distribution tasks to bare minimum. Only a small number of MHE are required (e.g., rough terrain forklifts, cranes mounted on HEMTT, LHS vehicles).

Under the new Force XXI distribution system, stockpiles are reduced at each node, and there is more reliance on distribution. This requires more throughput and less configuration at forward supply points. As a result, the normal progression from a supply-based to distribution-based resupply system effectively uses the capabilities of the LHS.

With the addition of the Container Handling Unit (CHU), which has been approved for fielding on approximately one-half of the PLS in the fleet, the PLS can also pick up and deliver a standard 20-foot ISO container without the requirement for a flatrack. In Bosnia, the delivery of containers on flatracks quickly reduced the number of racks available and caused



Photograph provided by the author

FIGURE 1 – CHU WITH CONTAINER ON A HEMTT-LHS

disruptions in the supply flow as containers either had to be returned on the rack, or container handling equipment was needed to remove the container from the rack so it could be returned without the container.<sup>27</sup> The only requirement is that the weight of the container not exceeds the PLS capacity of about 18-tons (16.5-tons for a standard load plus the weigh of a standard flatrack of a little over 1.5-tons). In addition to being faster and less manpower and time intensive, the use of a CHU increased the weight the container could carry as a result of not having the weight of the rack to contend with. It is also compatible with our NATO allies as it complies with NATO standards.

Roads into Bosnia were extremely difficult for commercial vehicles to traverse due to the condition of the roads and terrain. The use of commercial vehicles is also labor and time intensive. As a result PLS was the vehicle of choice for U.S. forces.

Racks are the most efficient way to move supplies. Fuel and water are suited for modules and the use of LHS allowing the conversion of single-use vehicles to multi-use. This allows for the use of non-liquid designated LHS vehicles to supplement as needed. With the addition of the enablers, the use of racks becomes much more effective as well as efficient for all classes of supply distribution to include water. With the use of liquid modules, the increased mobility of the PLS is available for the delivery of liquids as well as dry cargo.

The use of CROP has additional advantages over a standard flattrack. When a CROP is used to ship supplies inside a container, the need for dunnage to block and brace the materiel in the container is tremendously reduced or eliminated. This results in savings in personnel to build the blocking/bracing and in the need for lumber. When using CROP inside a 20-foot container, materiel is more secure, is better protected from the elements, and is less likely to suffer damage than when shipped as bulk cargo. This allows a much faster throughput of supplies to the theater. The containers can be moved to hub location near or in the SSC theater of operation either by LHS-equipped vehicles of the appropriate gross vehicle weight rating or by standard commercial vehicles. These standard vehicles can consist of Army owned 34-ton flatbed trailers, contracted trailers, or specially designed tandem container trailers with either Army owned or contractor tractors. The use of CROP provides the greatest degree of flexibility.

There is an opportunity to generate efficiencies in sustainment for SSC operations through the synergy of using configured loads for each coalition partner and using pooled vehicle assets. The use of flattracks and 20-foot containers for this configuration and delivery will simplify this operation and be very effective. New technologies will further improve the capabilities of these systems.

The disadvantages primarily are the increased need for coordination among the coalition partners in the sector and the added burden placed on the coalition lead for that sector to provide the supplies to each partner. Additionally, there is an increased requirement for LHS-equipped vehicles to deliver to each partner. These disadvantages are overcome be the extensive advantages of using Force XXI increased velocity concepts and enablers to provide superior support to the coalition forces.

## **CONCLUSIONS**

The use of Force XXI velocity management concepts by a single country responsible for delivery of supplies to all coalition partners in their sector provides the best effectiveness and efficiency of distribution management. When this is done with the use of Force XXI CSS enablers, the efficiency is maximized and road congestion is minimized. All coalition partners will benefit from the efficient delivery of supplies that meet timelines and deliver the right supplies at the right time to the right place.

## **RECOMMENDATIONS**

The recommended alternative is to have the coalition partner responsible for the sector provide the distribution of supplies to each partner in the sector using the modern Force XXI focused logistics distribution concepts and enablers as described earlier. Supplies would be delivered to each coalition force on flatracks or in containers to their area of responsibility and they would unload and make distribution to their forces. This would be done using the new PLS-E as well as new lighter versions of the PLS for U.S. Forces (HEMTT-LHS and FMTV-LHS) and by NATO standard PLS compatible vehicles used by our NATO allies. Countries that are leading a sector and do not have vehicles that comply with the NATO flatrack standard would have to be equipped and trained on the use of this equipment. The equipment can be provided either by selling it through foreign military sales (the preferred method as this will spread the technology to our other partners and insure compatibility) or by loaning the equipment to them for the duration of the operation.

Pearranged agreements must be developed with coalition partners before the formation of the coalition to insure that each partner understands the level of support to be provided by each partner. Legal issues need to be resolved first as the law currently limits some support relationships. In these cases, Congress needs to be informed and provided with suggestions as to changes required to reduce the restrictions. Actions taken with coalition partners before operations are necessary can set the stage for successful logistics coalition operations.

Close coordination of requirements among coalition partners is essential to ensure that loads are properly configured and dispatched to the proper location. To insure compatibility, the design of flatracks and modules should continue to be designed to meet NATO standards. For non-NATO countries, the U.S. should consider promoting the NATO standard for flatrack interoperability.

And finally, CASCOM should consider the inclusion of SSC operations, and especially coalition operations, in the Force XXI doctrine.

Word Count = 5,006

## ENDNOTES

<sup>1</sup> William S. Cohen, Annual Report to the President and the Congress (Washington, DC: U.S. Printing Office, 1999), 3-4.

<sup>2</sup> William S. Cohen, Report of the Quadrennial Defense Review (Washington, DC: The Pentagon, 1997), 11.

<sup>3</sup> Nans Binnendijk, ed., Strategic Assessment 1998: Engaging Power for Peace (Washington, DC: U.S. Government Printing Office, 1998), 153.

<sup>4</sup> Cohen, Report of the Quadrennial Defense Review, 11-12.

<sup>5</sup> Binnendijk, 153.

<sup>6</sup> Ibid., 164.

<sup>7</sup> Cohen, Annual Report to the President and the Congress, 145.

<sup>8</sup> Ibid., 11.

<sup>9</sup> Department of the Army, "The Revolution in Military Logistics," briefing slides with scripted commentary, The Pentagon, 28 January 1998.

<sup>10</sup> Cohen, Annual Report to the President and the Congress, 124.

<sup>11</sup> Logistics Integration Agency, The Army Strategic Logistics Plan, Change 1 to ASLP Version 1 (28 February 1995) (Alexandria, VA: Logistics Integration Agency, 19 March 1997), 10.

<sup>12</sup> Tom Edwards, Deputy to the Commander Combined Arms Support Command, interviewed by author, 3 December 1999, Fort Lee, VA.

<sup>13</sup> William J. Clinton, A National Security Strategy for a New Century (Washington, DC: The White House, December 1999), 18.

<sup>14</sup> Ibid., 28.

<sup>15</sup> The Joint Staff, Joint Vision 2010 Focused Logistics: A Joint Logistics Roadmap (Washington, DC: The Joint Staff), 26.

<sup>16</sup> LTG Billy K. Solomon, Commanding General Combined Arms Support Command, interviewed by author, 20 December 1999, Fort Lee, VA.

<sup>17</sup> The Joint Staff, 27-28.

<sup>18</sup> Ibid., 25.

<sup>19</sup> Alan Cunningham, James Behne, and Michael Byrd, National Training Center Rotation 99-05 Combat Service Support Analysis Final Report (Fort Lee, VA: CASCOM, February 2000), 7-11. This is the first document that actually discusses the 22 CSS concepts that were developed by the Combined

Arms Support Command to allow analysis during the subject rotation. Prior to this, the concepts were individually identified in various briefings, but not compiled or identified as "the Force XXI CSS concepts."

<sup>20</sup> David Jablonsky, The Owl of Minerva Flies at Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs, Professional Readings in Military History, No. 10 (Carlisle Barracks, PA: Strategic Studies Institute, Second Printing, July 1995), 13.

<sup>21</sup> Alan R. Cunningham, Palletized Load System Distribution Analysis (Fort Lee, VA: DLSIE, December 1993). These percentages were computed from Table 5 – Weight of Trailer/Flatrack When Fully Loaded, A-7, and Tables 8A and 8B – PLS Flatrack Loads Required in Division and Corps/EAC Areas, A-11 and A-12.

<sup>22</sup> Combined Arms Support Command, Load Handling System Concept Evaluation Program Final Report (Fort Lee, VA: CASCOM, 1997).

<sup>23</sup> Major Albin Majewski and Major Dee Smith, Combined Arms Support Command, interviewed by author, 3 December 1999, Fort Lee, VA. Both of these officers spent time in support units in Bosnia and had extensive experience with coalition partners.

<sup>24</sup> Combined Arms Support Command, Revised Study Report for Palletized Load System in Force XXI: A Comparative Efficiency and Use Analysis (Fort Lee, VA: CASCOM, 2 July 1998), 33.

<sup>25</sup> Clinton, 18.

<sup>26</sup> Cunningham, 5-19.

<sup>27</sup> Majewski.

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